DOCUMENT RESUME

ED 263 633 CS 505 093

AUTHOR Vandehaar, Debb
TITLE Technological Effects on Interpersonal Communication: A Classroom Activity.
PUB DATE 15 Jun 85
NOTE 16p.; Paper presented at the Annual Meeting of the Iowa Communication Association (Cedar Rapids, IA, September 13-14, 1985).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Behavior Change; Communication Research; Computers; Higher Education; *Interpersonal Communication; Models; *Nonverbal Communication; Simulation; *Technological Advancement; Telecommunications; *Teleconferencing
IDENTIFIERS *Communication Behavior

ABSTRACT

Noting that few scholars have examined specifically how technology is affecting basic communication processes, students in interpersonal, small group, and advanced presentational forms classes studied the systems model of interpersonal communication. The systems model described by P. Emmert and W.C. Donaghy includes the following components: environment, shared field of experience, input-processing-output subsystems, verbal and nonverbal messages and feedback, and interference. Students then communicated with each other via a simulated computer conference and teleconference and analyzed how the model's components were affected by these technologies. Generally, the students thought the technologies destroyed the components of the systems model and thus would cause less effective communication. The major components that were affected by both computer conferencing and teleconferencing were the nonverbal messages and feedback. With the absence of all nonverbal cues in both simulations, students missed the emotional aspect, attitudinal message, role negotiation, and turn taking of face-to-face interaction. However, the negative responses failed to consider that such changes do not automatically adversely affect communication effectiveness. Rather than assuming that change in these implicit components damages effective communication, communicators can consciously recognize and thus promote control of these components, thereby increasing communication effectiveness with these technologies. (HTH)

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TECHNOLOGICAL EFFECTS ON INTERPERSONAL COMMUNICATION: A CLASSROOM ACTIVITY

Debb Vandehaar
Dept. of Speech Communication
Buena Vista College
Storm Lake, IA 50588

Summer Address:
716 N.E. 6th
Ankeny, IA 50021

A paper submitted for the Iowa Communication Association's 1985 Annual Convention competitive papers panel

June 15, 1985

ABSTRACT

As mass communication instructors are spending much time discussing communication technologies, interpersonal communication instructors rarely touch upon the effects such developments have upon the basic communication processes. This paper describes a classroom activity in which students used (via simulated methods) computer conferencing and teleconferencing then analyzed how the technologies specifically affect components of the systems model of interpersonal communication. The author then interprets student responses, raises questions for future classroom activities, and issues a charge for more instructor attention to technological impacts on interpersonal communication.

CS 505 093

As mass communication instructors continue to build lectures on such developing technologies such as teleconferencing and computer conferencing, little is being discussed in the communication theory or interpersonal communication classrooms on the communicative effects of such techniques. As these technologies allow 2-5 persons to communicate with ongoing feedback opportunity for all, no longer can the interpersonal communicative product of these conduits be studied exclusively within the mass communication context. The purpose of this paper is not meant as a scientific study but rather the sharing of a classroom activity which focused on exploring the effects computer conferencing and teleconferencing had on the systems model of interpersonal communication; based on this activity I challenge other interpersonal communication instructors to integrate technology-related issues into their classrooms. I will begin by discussing the type of current resources available this topic, describe the classroom activity, report the students' responses to the activity, present my interpretation of the students' responses, and then finally suggest how further work in the area may be carried out.

Available Resources

The reason for conducting this classroom activity aimed at discovering the effects modern technologies have upon interpersonal communication processes traces back to the lack of resources on the subject. Granted, many journal articles, books, and courses are available on the general topic of social effects of developing communication technology and techniques. Examples of journal articles include Holmberg's (1984) "Stray the Course: Technology's Impact upon the Representative-Elector", Auyash's (1984) "Exploring the Impact of Technology on Communication in Medicine and Health", and Hellweg, Freiberg, and Smith's (1984) "The Pervasiveness and Impact of Electronic Communication Technologies in Organizations: A Survey of Major American Corporations." Books like Kerr and Hiltz's (1982) Computer-Mediated Communication Systems and Williams' (1982) The Communication Revolution speak to the general categorical effects of technology upon business, transportation, politics, health care, the workplace, leisure, education, and world order. In addition, at Anneberg, Dutton (1984) teaches a course entitled "Social Dynamics of Communication Technology" and Rice (1984) teaches " Computers as Communication Media.

Although these works and many more are attempts at examining the general sociological consequences of technology, few scholars have examined specifically how technology is affecting the basic communication processes. In the article "Technology and the Crisis of Self", Gratz and Salem (1984) come closest to addressing the issue of interpersonal

communicative effects from technologies; they conclude that contemporary technologies cannot fulfill many social functions thereby limiting vehicles for defining self concept.

Williams (1984), of Anneberg, also begins to address this relevant issue by facilitating the seminar "Technology and Communicative Behavior". He focuses upon the applications of human communication theories for the improvement of the human-and-technology interface; the seminar emphasizes the individual's involvement with the technologies directly or through the management of the behaviors of others. Initially Williams spends seminar time discussing the theories of attitude change, cognitive effects of media, human information processing, information systems and cybernetics, interactive media effects, interpersonal communication, small group communication, organizational communication, and social diffusion of information uses and gratifications. He then integrates in the effects the following applied technologies may have upon the above theoretical ideas: new telephone systems, teleconferencing, computers, information management, word processing, copiers, electronic mail, and electronic funds management.

Classroom Activity

Because of the lack of resources dealing with specific effects modern technologies have upon the basic communication process, I decided to charge my students with exploring the issue. During the spring term of 1985, students in my interpersonal, small group, and advanced presentational forms classes studied the systems model of interpersonal communication; then after communicating with each other via a simulated computer conference and teleconference, they analyzed how the model's components were affected by the technologies.

The system model described by Emmert and Donaghy (1981) includes the following components: environment, shared field of experience, input-processing-output subsystems, verbal and nonverbal messages and feedback, and interference.

The environmental component of the model includes both internal and external elements of communicative context. The internal environment of the interaction considers each interactant's personal thoughts or intracommunication and the role negotiation or multi-perspectives (Laign, Phillipson, and Lee, 1972) in the dyad. External factors in the context include local physical stimuli as well as national, world, or cosmos phenomenon. Emmert and Donaghy (1981) argue the importance of the environmental element in that both in the dyad continually interact with it to some extent or are influenced by it.

Equally as significant as the environmental context of the communicative act is the field of experience of each of the interactants. This field includes all interactions with and experiences within the interactants' past; it includes education, family, culture, and even physiological makeup. The interactants' field of experience affects how they perceive, use language, and think. Emmert and Donaghy (1981) propose that interactants must find commonalities in each others' field of experience before effective communication occurs.

The trilogy of input, mental processing, and output subsystems also play an important role in the systems model. The input and output subsystems are those organs which produce or receive verbal or nonverbal stimuli, namely the ears, eyes, nose, mouth, and body appearance and movement. The mental processing subsystem includes The thought processes of reasoning, motivation, perception, and conceptualization.

Obviously these subsystems produce and consume verbal and nonverbal messages and/or feedback. Depending on point of origin, the cue may be interpreted as a message or feedback. And depending on whether the cue manifests verbal qualities, the stimulus is considered verbal or nonverbal. Emmert and Donaghy (1981) delineate three types of cues: primary, complementary, and auxiliary. Basically, the primary cue carries the task element and is verbal; the complementary cue carries the emotional, attitudinal, relationship, and turn-taking elements and is nonverbal; and the auxiliary cue carries the preconceived biases of the interactants.

The final component of Emmert and Donaghy's (1981) systems model is interference; because interference considers the distracting elements of the environment, this component seems an unnecessary feature of the model.

After discussing the components Emmert and Donaghy (1981) deem essential to communicating interpersonally, I charged the students to communicate interpersonally via a simulated computer conference and teleconference.

For the simulated computer conference, the students sat at the various Vax mini-computer terminals in the computer center and conducted an interactive dialogue via the keyboard and the screen utilizing the Vax's Phone software. Although realistically only separated by inches or feet, the students imagined the other person(s) was (were) located in Topeka. They then "called" another student onto their screen. At this point, the screen split in half with the top showing the ongoing message creation of one student and the bottom showing the simultaneous message creation of their

interactant.

The small group communication students were challenged to "call" three other members of their group onto their interactive screens and carry on a four way discussion of each member's summer plans; this discussion separated each interactant's screen into four simultaneous message-creating sections.

Also in this small group communication class, we took this conferencing a step further by modifying the Delphi group technique on the Vax. The Delphi technique is an alternative to exclusive face-to-face group interaction whereby a leader sends a decision-making charge to group members; by responding to each other in an anonymous chainletter fashion, they gain a consensus in the written form before meeting face-to-face to discuss the details of the decision. Although the anonymity feature enhances the Delphi technique's value in a reticence plagued group, lack of spontaneous interactive responses by group members utilizing Delphi costs the group the synergism asset.

With the expertise of our computer center's director, Dr. Joe Trailor, our computer modified version of Delphi sought to accomplish both the positive and limiting elements of the standard Delphi technique: anonymity and group synergism. The group decision-making charges were sent to each group member via the Vax's electronic mail system; along with the charges, group members were given a secret code to use in the interaction to ascertain anonymity. Members individually then went to their accounts, read the message, and sent back their independent proposals and rationale to the leader via electronic mail. The leader transferred each message and the member's code into a "running file" This file could be read, added to, or deleted from by any member of the group.

Therefore, with the proposals in the file, the interactive, somewhat spontaneous, group discussion began. Group members could read and analyze each others' ideas and reasons when they were near a terminal then anonymously argued for or against acceptance of each as the best solution to the problem thereby accummulating additions to the file. Three responses were required of all group members. In three out of the six groups, obvious synergism emerged as the final consensus produced an idea unique from each of the originals. Other synergism occurred as members based arguments upon other member's previously mentioned arguments.

Finally, I charged the students to experience a simulated teleconference. By using the camera, videorecorder, and big screen we directly wired two adjacent Harvard classrooms; two students in one room were challenged to imagine that the two students from the other room were located in Honolulu.

They watched each other's larger-than-life images on the huge screens while interacting about what improvements were necessary on the campus.

In the advanced presentation class, students integrated the computer into the teleconference; they built "what if" charts and graphs in front of the camera in one room and while simultaneously sending it to the other room (rather sunny Honolulu) for feedback and revision on the big screen in front of a larger audience.

Students' Responses

After discussing the systems model of interpersonal communication and experiencing computer and teleconferencing simulations, students responded to the question of how the systems model was affected by each of the technologies in class discussions and as an exam essay question. Generally, the students thought the technologies destroyed the components of the systems model and thus would cause less effective communication. The major components which were injured by both computer conferencing and teleconferencing were the nonverbal messages and feedback.

With the absence of all nonverbal cues in the computer conferencing simulation, students missed the emotional aspect, attitudinal message, role negotiation, and turn taking of face-to-face interaction. Students found that they needed to guess the others' sincerity of the message or response because they were not used to or able to encode or decode these attitudes and feelings via the words of messages or feedback. Occasionally, students used a repetition of punctuation marks or other keyboard symbols to convey high emotional or attitudinal intensity. Some students projected the development of new words better able to describe attitudes and emotions. However, other students thought that lack of nonverbal cues may decrease the double bind phenomenon (a verbal and nonverbal cue contradiction).

Another common problem for the students was the ineffectiveness of the turn-taking system due to no intonation or eye contact in the computer conference simulation. Because both interactants could simultaneously send messages to the others' screen, and because some students type much slower than others can read, students began typing in their reaction to the others' message before its completion and thus failed to "listen" to the complete intention. Therefore, students concluded that the most effective communicating took place between communicators of equal reading and typing speeds; if interactants possessed disparate reading and typing skills, the interactant with better skills dominated the dialogue turn-taking allocation and content. Several students expressed feelings of being ignored and sending ineffective feedback when they lost the attention of their partner due to lack in typing or verbalizing skills; in face-to-face interaction students felt they accomplished this interpersonal attention through implicit turn-taking rules, paralinguistics, and facial expressions. Those involved in a small group discussion found that addresses became much more important with lack of eye contact.

During the teleconferencing simulation, students again talked most about the ineffectiveness of the nonverbal system.

Although utilization of this medium allowed students to see and hear each other, they became much more conscious of the limitation of proxemic control and good eye contact. The lack of physical presence and touch of the interactants caused the students to think the others could be lying to them or not sincere in their messages. Because the images on the screen were not as clear as the students were used to on commercial television or in real life, clear eye contact was difficult. (Poor lighting techniques caused glasses wearers even less clear eye contact.) Again addresses and poignant hand gestures were needed for smooth turn-taking due to lack of eye contact; eye movement to indicate turn allocation was limited by the distortion between the camera lens size and the project of the image on the screen. Students were also limited to sending and receiving cues of the upper torso which cut off some of the intensity level cues of lower body movement and position and possible deceptive leakage cues from feet movement. Depending on the size of the screen (be it a big screen or an 8 inch monitor) students thought that facial and body movement could be interpreted inaccurately due to the exaggeration of cues on the large screen or the minimization on the smaller monitor. And finally, some students found it difficult to remember to open body position and eye contact to include those on the screen instead of just addressing the other student adjacent to them in the same room.

The next component of the systems model students thought most injured by the technologies was the environmental context. In computer conferencing some students said they spent much time explicitly asking their interactant whether they were female or male and what they looked like in addition to a description of their local environment. As students projected beyond the simulation, they proposed even more time would be spent on describing the exotically different geographical and cultural environments linked by the computer conference.

Likewise, students were concerned of the environmental conditions in the teleconference. Although they were able to see the interactants sitting in front of the camera, their questions ranged from the weather to the office layout of the simulated location. Many students expressed concern on the possible facade nature of the environment which appeared on the screen; they described fearing exclusive use of teleconferencing for managerial checking of various outposts as the manager could only view a staged slice of the organizational environment.

In both the computer conference and the teleconference, students thought one more component of the environment fell into play -- the medium itself. Students expressed concern about the security and reliability of the computer system as

well as lack or possession of computer and keyboard skills in building impressions of their interactant. The most common complaint about the teleconference was that the students could not see their own image which was transmitted to the others in the conference (a phenomenon not available in common face-to-face interaction); they wanted to have a monitor alongside the camera and big screen showing their picture. From this demand, students realized their intimidation and skepticism of the camera, projector, and big screen; because they thought the equipment may distort their appearance (as they have learned it does commercial television presenters), they wanted reassurance of their presentation as viewed from the monitor.

Yet another consequence of the technologies on the environmental component of communicating dealt with the relational environment. According to Laign, Phillipson, and Lee (1972), three levels of interpersonal perception exist in every communicative setting - direct, meta, and meta-meta perspective. From these perceptions of the other, interactants negotiate perceived roles which determine communicative behavior. Since most of the perspectives are built upon nonverbal cues, students thought the computer conference minimized perspective building and thus generated more blunt, rude, and sometimes deceptive escalating verbal interaction.

Students also thought the two technologies limited developing shared fields of experience. Since many believed that building fields of common experiences is greatly affected by nonverbal cues of physical appearance, facial emotional and attitudinal cues, and intonation, the computer conference stifled this communicative necessity. In addition, the geographical and thus possible cultural disparity of interactants linked via a computer conference caused students to believe that interactants would have to spend more time finding common ground.

The time and thus cost of communicating via an actual computer conference or a teleconference lead students to believe that the verbal component of the systems models would also be affected. In a real computer conference or teleconference where time means money, they thought they would chose much more concise language both when typing in the keyboard and vocalizing in front of the camera. Also as mentioned above, the lack of nonverbal cues to carry emotional and attitudinal meaning caused students to project the need for developing more words to succinctly describe emotions and attitudes.

Several students also expressed a possible affect on the input-mental-output sub-systems of the systems model due to computer conferencing. As the students were challenged to compose-as-they-go on the keyboard, several expressed the

point that reading and typing input and output required more conscious mental activity whereas hearing and talking occurred more unconsciously and thus less taxing. Therefore, additional metal processes required to read and type reduced energy the students normally spent on motivational, perceptional, and conceptual mental activities.

Interpretation of Student Responses

In all, the students deduced that the technologies of computer conferencing and teleconferencing broke down the systems model of interpersonal communication; nonverbal cues, the environmental context, fields of experience, verbal cues, and mental processes were most affected.

One exception to this generalization was a few students' thoughts that both technologies allowed more communication with geographically and culturally diverse interactants thereby giving interactants an opportunity to build more diverse fields of experience which would aid in future communicative situations.

However, many of the students' negative responses failed to consider that change in the systems model of interpersonal communicating does not automatically adversely affect communicating effectiveness. Generally, the students commented upon change of the model's implicit factors -- those components which interactants rarely consciously recognize like nonverbal cues, the environment, and shared fields of experience. But rather than deducing that change in these implicit components damages effective communication,

I argue that the technologies challenge communicators to consciously recognize and thus promote control of these components; this additional awareness of and control of implicit factors (virtually changing them into explicit factors) of the systems model therefore will increase communicative effectiveness.

Gratz and Salem's (1984) research on technology's effect on development of self concept supports part of this contention. Grazt and Salem (1984) argue that person-computer interaction denies the person the opportunity to negotiate roles and construct the mirror through which they view themselves and their interactants.

> Unlike the development of interpersonal relationships between two human-beings, man-machine interaction involves at best the development of a linkage between a quasi-open system and a quasi-closed system...
>
> The very precision that makes the computer ideal for solving mathematical problems sharply limits its ability to simulate truly human relational behavior.

These scholars go on to advocate augmenting the person-computer interaction with relationship building training.

> The key to success in avoiding the negative consequences described earlier would appear to be effective systems design with appropriate sensitivity to the importance of high quality opportunities for development of relationship building skills.

The article suggests such skills could be built indirectly through creative dramatics and improved family recreational programs, as well as directly by quality interpersonal

communication courses.

Grazt and Salem (1984) do not openly suggest technologies cause the implicit components to become more explicit, as I do, but an analysis of the article provides indirect support for my interpretation of my classroom activity. They state that relationships and self concepts are negotiated and developed through interaction and thus implicitly affect the communicative environment. They then go on to suggest training people in how this occurs thus making interactants more aware of this implicit factor of communicating.

Although these scholars do not go on to support my contention that these implicit-made-explicit communication components may improve communication effectiveness, we share concern that the study of technology effects on interpersonal communication is relevant and imperative.

> Teachers of human communication should assume an active role in understanding emerging technologies and in explaining the importance of their programs as a complement to increasing student involvement with the computer.
>
> The possibilities for an amazing new era are immense, provided that we can exercise the wisdom we need to balance our new knowledge. Our human compulsion to reduce the uncertainty in our lives suggests that widespread acceptance of the new technologies and their many promises is inevitable, but the task of confronting the human communication impact of these new tools remains only dimly recognized.

Future Activities

The exploration into this area has merely begun. The exercise I charged upon my students focused upon how use of various technologies to communicate with another person affect the interpersonal communication systems model while Grazt and Salem (1984) analyzed which behaviors learned from human-technology interaction may transfer to human-human interaction. I plan to combine these two ideas in an interim class entitled "Communicating in 1990 and Beyond" and charge students to analyze how human-human interaction via technology behaviors transfer to face-to-face human-to-human interaction. For example, we will attempt to answer questions like, how will new emotional words developed for computer conferencing affect my chat with my dean? Will my ability to read nonverbal cues diminish with computer-conferencing interactions? Will widespread teleconferencing affect sending and receiving proxemic cues in actual interactions?

Other questions I hope to get at in the class and hope other speech communication instructors will address include the following: How will technologies yet in development affect these interpersonal communication components? If indeed technologies change implicit features of communicating into explicit ones, what role will interpersonal communication courses in colleges and industry play in interfacing the new technologies with students and employees? What role should speech communication researchers and scholars play in

technological development? Which components of interpersonal communication are existent in artificial intelligence programs?

The questions will continue whether or not our discipline chooses to address them. What I report above of my classes' simulated technology activity and the student response is not presented as empirical data, but rather as a description of what can be done in actively charging ourselves and our students to investigate what impact technologies have today and tomorrow upon our basic communication system. Classes like William's (1984) and articles like Gratz and Salem's (1984) expedite the issue. Hopefully, more interpersonal pedagogical experiences encouraging students to not only become more conscious interpersonal communicators in the new technological age, but also encourage them to begin their own studies aimed at asking and answering questions related to technological effects on interpersonal communication will emerge.

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